

# Alliance Portal Expedition (Java CoG Kit Demonstration)

## GridAnt: Client-Side Workflow Management for Grids

### Technology: GridAnt

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With the perspective of the Grid user in mind, a simple yet powerful client-side workflow management system has been developed. The system, called GridAnt, provides much-needed functionality for developing and testing Grid applications with the Globus Toolkit version 2 (GT2) and version 3 (GT3). As the workflow engine, GridAnt uses the commodity technology Apache Ant because it is a popular "build" tool used extensively in the Java community. Its current functionality allows the management of complex dependencies and task flows within the project build process. We have extended this functionality by providing customized Ant tasks to access the Grid along with intertask communication mechanisms.

GridAnt proves to be an excellent tool, not only to map complex client-side workflows, but also as a simplistic client to test the functionality of different Grid services. GridAnt will help applications make a smooth transition from GT2 to GT3. GridAnt is not claimed as a substitution for more sophisticated and powerful workflow engines like WSFL, BPEL4WS, and GSFL, which map complex business processes. Nevertheless, applications with simple process flows that are tightly integrated to work with the Grid technology can benefit from GridAnt without having to endure any complex workflow architectures. The philosophy adopted by the GridAnt project is to use the workflow engine available with Apache Ant and develop a Grid workflow vocabulary on top of it.

Currently we support mechanisms to enable Grid access such as authentication, remote job execution, and file transfers. Other tasks are under development. We provide a technology preview through the GridAnt Web page\*:

<http://www.globus.org/cog/projects/gridant>

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### Application: Position-Resolved Diffraction

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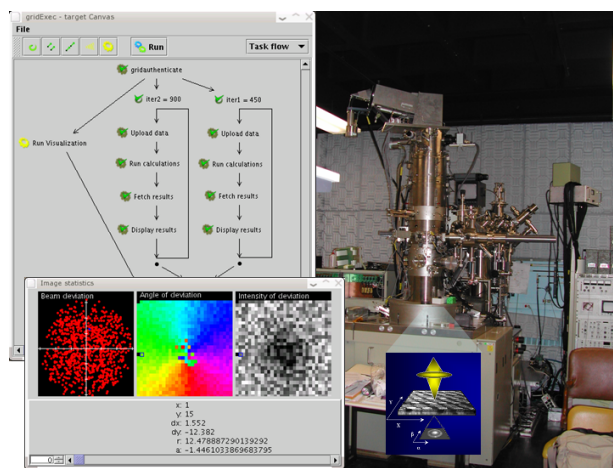


Figure 1: Position-Resolved Measurements

A new experimental technique, Position-Resolved Diffraction, has been developed for the study of nanoscale structures using Argonne's Advanced Analytical Electron Microscope. With this technique a focused electron probe is sequentially scanned across a two-dimensional field of view of a thin specimen. At each point on the specimen a two-dimensional electron diffraction pattern is acquired and stored, as illustrated in Figure 1. Analysis of the spatial variation in the electron diffraction pattern allows a researcher to study the subtle changes resulting from microstructural differences, such as ferro- and electromagnetic domain formation and motion, at unprecedented spatial scales. As much as 1 terabyte of data can be taken during such an experiment. We use the Java CoG Kit and GridAnt to manage a number of computational resources that analyze the images taken and display the result of these calculations.